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ABSTRACT

This monograph, the fourth in a series pertaining to the Early Childhood-Special Education Teacher Preparation Program at the University of Virginia, describes the highly structured directive teaching process. The foremost example of the directive teaching process is the Bereiter-Englemann model which is geared toward alleviating the language and conceptual deficits often observed in disadvantaged children, by using a highly structured educational environment. The seven major principles of learning and instruction which underly this model are discussed. A description of how the model functions in the overall program of language, reading, arithmetic and music and a discussion of the presentation and feedback strategies basic to this approach are included, along with depiction of the interaction patterns which evolve from use of the directive process. Module requirements and cognitive and skill competencies to be acquired by the student are outlined. (ED)

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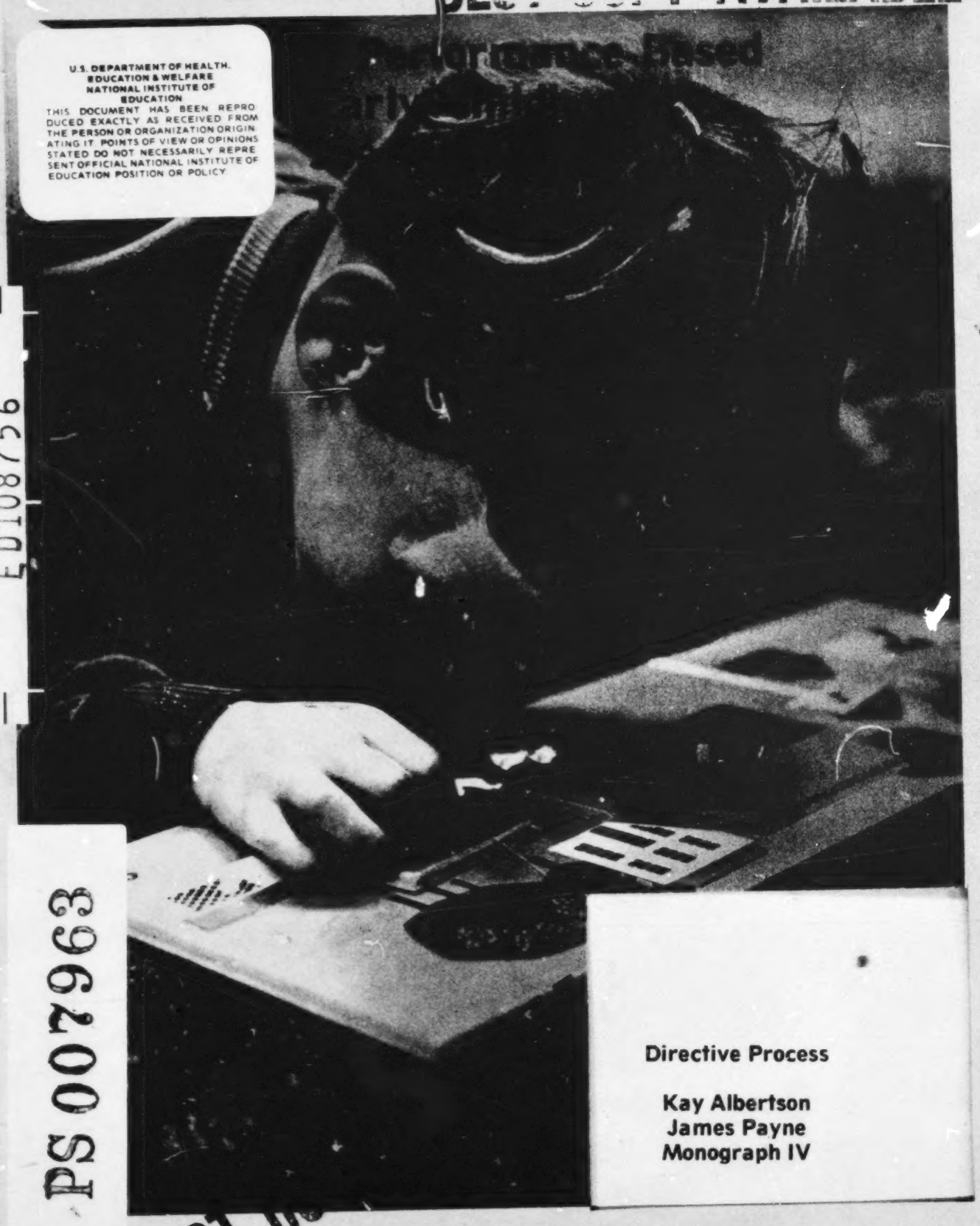

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Directive Process

Kay Albertson
James Payne

Monograph IV

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THE DIRECTIVE TEACHING PROCESS

The highly structured directive process consists primarily of a triad of events. An antecedent behavior of the teacher (antecedent stimulus: Sa), followed by a pupil response (R), which is reinforced or corrected by the teacher (subsequent stimulus: Ss). For example, if the teacher wants the child to learn the name of an object (e.g. a block), she might show the child the block and say, "This is a block. What is this?" (Sa), to which the child might respond, "Block" (R), which the teacher could reinforce with, "Yes, this is a block, Good talking!" (Ss) (Kauffman, et al 1973)

In less directive teaching either the Sa or the Ss variables is frequently omitted, making instructional behavior predominantly dyadic. The teacher may reinforce or correct spontaneously emitted response (R——Ss) or prompt responses which she neither corrects nor reinforces (Sa——R). For example, the child may find a block on the table and emit the response "Block" (R), after which the teacher may say, "Let's play with these blocks" and present the child with various blocks (Sa), to which the child responds by playing with the objects (R), which is not followed by any teacher reaction.

Bereiter Engelmann Program

The foremost example of the directive process in

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American education is the Bereiter-Engelman Program (1966). It is the most marked departure from the free-play, "whole-child" model for early childhood education. The program's expressed purpose is to increase the probability of subsequent academic success for children from disadvantaged circumstances. The curriculum is geared toward alleviating the critical deficits often observed to characterize disadvantaged children (i.e., deficits in language and specific concept development). Bereiter and Engelmann feel that many underprivileged children enter into formal schooling a year or more behind in areas such as language and cognitive skills. Bereiter-Engelmann also believe that these initially deficient states can be ameliorated by a short-term, highly structured intervention process where time is a most precious commodity. Bereiter and Engelmann have included in their rationale a currently popular view in developmental psychology. This view states that the most important role to be served in a child's development is the active role served by the child himself, (White, 1959). The child needs certain equipment which will stimulate the successful pursuit of self-development if this active role is to be achieved. Children who lack this equipment must be helped to acquire it. Bereiter-Engelmann contend that the needed cognitive equipment can be acquired most efficiently in a highly structured

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educational environment. Cognitive competence, in turn, provides the basis for such important affective characteristics as positive self-esteem and self-confidence. Language training provides the basic substance of the program. This training is intended to strengthen the child's use of language, particularly with respect to logical reasoning. Language training is extended into reading and arithmetic and is supplemented by music activities. Thus, the whole orientation of the program is cognitive. The program is implicitly founded on a strict application of stimulus response learning theory.

Principles of learning and instruction. Few assumptions are made about the nature of childhood and/or motivation in the Bereiter-Engelmann program. It is recognized that all children have a capacity to learn and that, in the case of disadvantaged children, learning problems are induced primarily by the environment, i.e. an outgrowth of faulty learning experiences. Therefore, learning problems can be overcome under the proper environmental circumstances.

Implicit in the design of the learning activities is the belief that children seek to master their own environment. Words, songs, games and subtle forms of competition ("Here's a hard one——I'll bet I'll trick you with this one.") are used to motivate and appeal to young children.

Evans (1971) lists seven major Bereiter-Engelmann

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principles of learning and instruction:

1. Behavioral objectives - The Bereiter-Engelmann curriculum is unsurpassed as an instructional program in clearly indicating the terminal behaviors it attempts to produce. The Bereiter-Engelmann program gives a detailed accounting of the skills it believes are required of children for academic success in the preschool and primary grades (15 skills in total). These skills are broken down into responses which may be directly observed and measured. All skills are stated in terms of observable behaviors (e.g., "The child will be able to name the basic colors, plus white, black, and brown.") They also provide functional cues for the planning of instructional activities and more importantly they clearly indicated to the learner what he is supposed to be learning.

2. Homogeneous Grouping - Children in the Bereiter-Engelmann program, theoretically all four years of age when they enter the program, are placed in small groups of approximately five members each according to demonstrated ability. The rationale for homogeneous grouping is this: "by reducing heterogeneity with respect to such variables as learning rate and conceptual repertoire, instruction may be streamlined, pacing geared appropriate-

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ly, and frustration levels reduced". (Evans, 1971) The very directive and convergent tasks presented to the children by the Bereiter-Engelmann curriculum make this grouping a reasonable procedure. It can not be overlooked, however, that ability grouping is not without its disadvantages, including the danger of typecasting a child with lower ability.

3. Active Involvement - Children in the Bereiter-Engelmann program are constantly making active responses with a great deal of emphasis on repetitive verbalizations. Both unison responses and frequent individual responses are encouraged within the small group interaction. A random-order recitation strategy (versus fixed oreder where children knew in advance when they'll be called upon) is requested and the motivational value of this strategy is supported by empirical research (Hudgins and Gore, 1966).

4. Immediate Feedback.- A recitation mode of instruction establishes one of the most important conditions of learning: immediate feedback (Gagne, 1965). The children in the Bereiter-Engelmann program constantly receive knowledge of the results of their actions. This type of reinforcement has two values: The first value is motivational - i.e.

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by responding to material structured to reduce error rate, the child may experience the success so necessary for the development of achievement motivation. The second value is informational in that when errors are made specific and unambiguous feedback from the teacher may indicate why a response was incorrect. Reward strategies are stressed for purposes of maintaining rapport and pupil motivation. Teachers are to reward effort, task-involvement (versus play motives), group cohesiveness and cooperation. Shaming, coaxing, and derogation are to be avoided. Rewards include both tangible (cookies, raisins, game privileges) and social rewards (praise and recognition). Bereiter and Engelmann, however, feel the real rewards for children will emanate from their newly learned skills. Disciplinary techniques include moderate physical punishment and social isolation (time-out).

5. Graduated Sequence - Language, reading and arithmetic activities are combined into a sequentially programmed curriculum which progresses from simple to complex. The sequence is essentially logical, based on conceptual hierarchies and linguistic structure.

6. Transfer - The ultimate objective of the

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Bereiter-Engelmann program is the concept of "transfer of learning." Transfer ability refers to the influence that learning which occurs at one point in time will have on subsequent learning or performance. In theory, the Bereiter-Engelmann curriculum is designed to increase the probability that mastery of its basic concepts will make future schoolmlearning more efficient and effective. (It must be pointed out that the transfer effects of the Bereiter-Engelmann program are not clear to date.) It is important to note also that the primary Bereiter-Engelmann emphasis is upon the learning of skills which will facilitate the learning of successively more complex material within conceptual systems, Gagne's "vertical transfer" (1965).

7. Criterion reference testing (Glaser, 1963) - Criterion reference is a form of assessment which attempts to evaluate instruction where the intent is to create a specific level of skill proficiency among children. In other words, if instruction is administered for the purpose of promoting among all children the achievement of particular goals, it follows that assessment procedures should provide evidence of the validity of instructional procedures (Evans, 1971). Either a child has attained

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the objective or he has not. If he has, mastery has occurred. If he has not, procedures must be redesigned. Children are not ranked or compared to each other. Rather their point of reference is the criterion established by a given instructional objective.

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Language curriculum. The Bereiter-Engelmann language curriculum is composed of an integrated set of basic concepts, sentence forms, and presentation strategies. Bereiter and Engelmann maintain that children must totally understand that language is a symbolic substitution for physical reality. For example, a child must learn that the expression, "Two balls are on the table", has a concrete referent which may be observed or created. The child, through language, is also provided with an independent check on the accuracy of his observations. For this reason, statements of fact represent the key element of the Bereiter-Engelmann teaching language (Bereiter and Engelmann, 1966).

Bereiter-Engelmann have developed a model for presentation strategies which has as its components the statement and the second-order statement, which modifies or expands the identity statement. Combined, these two statement forms possess the capacity to teach the basic concepts of the language program.

The identity statement provides the symbolic representation of an object: "This is a(n) _____." (e.g., "This is a block.") The second-order statement permits the further expansion and specification of concept attributes:

"This _____ is _____." (e.g., "This block

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is blue.")

Further variations of these statement forms are presented once the two basic forms are mastered. These variations allow for differential subject-predicate placement. Such variations include polar concepts (such as hot-cold, hard-soft), non-polar concepts, which pertain only to members of an identity class (e.g., "This ball is blue"). Where the attribute color is nonpolar and other members of the class concept "ball" may differ in color and non-polar concepts that represent a property shared by all members of a concept class (e.g., "This ball is a toy.").

The children in the Bereiter-Engelmann program learn how to identify, label correctly, and classify common objects in the environment. Bereiter and Engelmann also maintain that the language program has the capacity to develop the child's ability to formulate meaningful questions about the basic properties of concepts and relationships among concepts (Bereiter and Engelmann, 1966).

Bereiter and Engelmann use a technique known as "pattern drill" for teaching language concept. Teacher-pupil interaction is in the form of verbal presentation-demonstration followed by question and answer strategies.

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1.) First-order statements

(a) The identity statement - singular
This is a block.

(b) Identity statement - plural
These are blocks.

(c) Not statements
This is not a block.
These are not blocks.

2.) Second-order statements
non-polar attributes
(a) Color

(b) Prepositions

(c) Not

Second-order identity statements
(a) Classification
ex: animals, plants, parts, weapons, furniture

Second-order statements
Polar attributes
(a) Polar discriminations - singular
This _____ is _____ (fat, skinny,-
(tall, short, etc.)

(b) Polar discrimination-- plural
These are _____ are _____ (rough, smooth,
(etc.)

(c) Polar - "not"
This _____ is not _____.

(d) Polar deductions
If this is short, then this is not long.
If this is long, this is not short.
If this is not short, this is long.
If this is not long, this is short.

(e) Special polars
ex: before, after, next to

Reading curriculum. The reading program is based on the belief that the best way to teach reading is to

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concentrate on the operations that are involved in the reading act. Therefore, the program begins with verbal and sequencing operations that are necessary to perform reading responses appropriate for simple words. Children, therefore need to know the following four things: Children must:

1. Recognize letter-sound correspondence;
2. Know that sound sequences are indicated by the special arrangement of letters which are formed into words;
3. Understand that any spoken word can be spelled by holding each sound in that word (e.g., m-a-n);
4. Realize that any word said slowly (as in m-a-n) can be "said fast" and then identified at a normal rate of speech.

These four steps comprise the order in which initial reading skills are taught.

The later phases of the reading program include learning the alphabet (forward and backward), over 200 irregular words, the concept of capital letters, and an increased workload in vocabulary training and workbook activities.

Arithmetic curriculum. The arithmetic curriculum is based upon the assumption that arithmetic is a special form of language which involves different types of questions that may be answered correctly or incorrectly

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depending upon the child's store of knowledge.

The curriculum involves a set of strategies which are systematically arranged to teach arithmetical symbols, conventions and operations. Basic rules and strongly patterned problem-asking strategies are practiced under tightly subscribed conditions. The principal objective is the mastery of precision skills in basic arithmetic.

Music curriculum. Music activities are correlated with successive steps in the language and reading programs. These activities basically serve to reinforce language principles.

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BASIC TEACHING STRATEGIES AND ROLE OF THE TEACHER IN THE DIRECTIVE PROCESS

The Bereiter-Engelmann program is probably without peer in terms of the directive functions served by the teacher. This intensive academic orientation requires individuals who are extremely skilled in the implementation of language, arithmetic and reading activities. Nothing in the Bereiter-Engelmann program is left to chance, guesswork, or intuition. "Goals are concrete, teacher actions are deliberate, and sequencing is predetermined." (Evans, 1971). Bereiter-Engelmann take the position that teaching skills must be learned and perfected - there is no "natural-born teacher" - Engelmann is guided by the principle that teachers must be told exactly what to do and how to do it.

The mixture of teaching-techniques used in the Bereiter-Engelmann curriculum has been conceived specifically with small group instruction in mind. These techniques range from the mechanics of presentation to feedback strategies.

Teachers are advised of certain strategies for teaching. For example, while group activity is underway, an individual child should never be worked with for more than 30 seconds at a time. This policy is relevant to motivation - keeping children actively involved and the encouragement of total concentration as children take

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turns rapidly in the course of responding to teacher questions. Teachers are urged to use short explanations, geared at all times to the child's current store of information. Rhythmic phrasing of verbal statements and clapping are used to dramatize basic language patterns. Feedback is given constantly. The teacher must inform a child very clearly when he has or has not made a correct response.

Although the teacher works at a fast and steady rate of speed, children are not pressured to hurry or speak unnaturally fast. A violation of this principle defeats a main purpose of the Bereiter-Engelmann training, i.e., to expand and standardize expressive language. Children are encouraged to speak loudly and distinctly at all times. Liberal questioning by the teacher is essential to maintain the interaction which is characteristic of Bereiter-Engelmann instruction. Yet teachers are warned to avoid the use of "cues" or "prompts" because they may signal to the child the expected response. An example of such a "cue" would involve a teacher forming the beginning of a word on her lips.

A most significant teaching strategy is that which calls for differential levels of difficulty at varying times in the instructional period. Level one (least difficult) requires only that a child point to an example of a concept under study (e.g., "Show me which ball is

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blue."). Level two requires a "yes-no" answer to questions ("Is the ball blue?") The third level of difficulty requires a child to repeat basic statements (Teacher: "Is this ball blue?" Child: "Yes, this ball is blue.") Level four (most difficult) sequences that a child identify critical attributes or conceptual relationships by appropriate statements in the absence of direct questions (Teacher: "Tell me about this ball.") Difficulty level is varied according to the children's skill and fatigue level, although level four is preferred whenever possible.

In sum, the directive process can be characterized as a technique which is highly selective, teacher-centered and teaches convergently. Heavy stress is placed upon techniques and incentives which encourage children to work rapidly and steadily with a prescribed set of activities.

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Interaction Patterns in the Directive Process

As part of the professional and academic development of the students in the Early Childhood program at the University of Virginia, the staff videotaped selected interactions between these students and children of preschool and primary ages. The interactions consisted of teaching the children concepts using either the developmental or directive process.

The video tapes were subsequently analyzed in the following areas: strategy used, mode of interaction, content of interaction, and media motivation. A description and discussion of the above areas can be found in the module entitled Developmental Learning Process (Mann, 1974).

These tapes were evaluated by several judges and a high inter-judge reliability was achieved. Although the results have not been statistically analyzed at this time, certain trends or patterns have been identified in the interactions between the students and children. Both the directive and developmental teaching processes provided observable trends. However, for purposes of this module, only those patterns identified with the directive process will be discussed.

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To facilitate the reader's understanding of the teacher-pupil interaction pattern in the directive process, examples of directive teaching are presented and explained below.

RATING SCALE FOR DEVELOPMENTAL - DIRECTIVE PROCESSES

Teacher: Sandi
Developmental Outcome: Directive Process: Classification of Colors
Learner Characteristics of Child: 5 year old male--high risk; low vocabulary
Situational Variables: Classroom activity with one child

Incident	Strategy Used	Mode of Interaction	Content of Interaction	Media Motivation
1	IS	Id	BC	
2	VR	Not coded	Not coded	
3	DS	I	CC	Object (ball)
4	IS	Id	BC	
5	VR+Ex	-+Cl	- +CC	
6	DQ	I +Cl	CC	O (ball)
7	VR+NVR			
8	DS	I	Tb	
9	HQ	I	SI	
10	DS	I	CC	O (ball)
11	VR			
12	DS	I + Cl	CC	O (ball)

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The interaction is as follows:

Incident

1 - The teacher says, "Look at me." (Imperative statement (IS), giving a direction (ID) in order to control behavior (BC). The child responds by looking at teacher.

2-- The teacher verbally reinforces the child - "I like the way you looked at me." (VR)

3 - The teacher holds up a ball and says, "This ball is blue." (Direct Statement (DS) giving information (I) and classifying the ball as a color--blue. (CC)

4 - Teacher says, "Say, this ball is blue." (Imperative statement (IS) giving a direction (ID) while controlling behavior (BC). Child responds with, "Ball blue."

5 - Teacher reinforces child verbally saying, "That's good talking. (VR) The ball is blue." (Ex) (Extending the child's phrase "Ball blue.")

6-- The teacher questions the child, "What color is this ball?" (Direct question (DQ), asking for information (I) and also for a color classification (Cl) and (CC). Child responds, "Blue."

7 - The teacher reinforces the child verbally, "I really like the way you're talking today," (VR) and simultaneously pats his hand (non-verbal

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reinforcement - NVR).

8 - The teacher states, "I'm going to trick you this time." (Direct Statement (DS) giving information (I) by stating her (teacher's) behavior (TB).

9 - "Do you want to be tricked?" (Asks an hypothesis question (HQ) requiring only a yes-no answer--She seeks information (I) from the individual child (SI). Child responds "No!" to question.

10 - Teacher holds up blue ball and says, "This ball is red." (Direct statement (DS) giving information (I- <u>ball is red</u>) and classifies the ball according to color (CC). The child corrects her with, "Ball blue."

11 - Teacher verbally reinforces, "You're thinking hard today. Great." (VR)

12 - Teacher states, "This ball is <u>not</u> red--it's blue." (Direct statement (DS) giving information (I) and classifying the ball by color (Cl and CC).

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DIRECTIVE PROCESS COMPETENCIES

Cognitive Competencies

Student will demonstrate knowledge and understanding of the following:

1. Measurement of behavior
2. Basic behavior principles
3. Applied analysis of behavior
4. The elements that comprise the Bereiter-Engelmann approach to teaching reading, arithmetic, and language.

Skill Competencies

1. Be able to pinpoint or define a child's behavior as an observer; countable, repeatable movements of the child.
2. To be able to record reliably children's behavior in the classroom setting using an appropriate recording method (e.g., event recorded, duration, performance to criterion, etc.).
3. To be able to accelerate or decelerate the child's behavior using techniques derived from behavior principles (e.g., positive reinforcement, punishment, extinction, etc.).
4. To be able to access behavioral change by using an appropriate single subject design (e.g., reversal, multiple ba eline, changing criterion, etc.).

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MODULE SCHEDULE AND REQUIREMENTS

TOPIC: Bereiter-Engelmann Approach

INSTRUCTOR:

CLASS DATES:

FOUNDATIONAL MATERIALS:

Teaching Disadvantaged Children in the Preschool

Carl Bereiter and Siegfried Engelmann

Prentice-Hall

1966

SUGGESTED SUPPLEMENTAL READINGS:

Books

Bereiter, Carl and Engelmann, Siegfried. Teaching disadvantaged children in the preschool. Prentice-Hall, Inc., Engleweed Cliffs, N.J. 1966.

Science Research Associates, Inc.

1969

Conceptual Learning

Siegfried Engelmann

Dimensions Publishing Company

1969

Fox, Glenda Ann and Meyers, Linda. "A management system for Distar level I: Reading, Arithmetic, Language." Science Research Associates, 1973.

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Engelmann, S. The effectiveness of direct instruction on IQ performance and achievement in reading and arithmetic. In J. Hellmuth (Ed.) Disadvantaged Child Vol. 3, New York: Brunner-Mazel, 1970.

Meskevitz, S. Some assumptions underlying the Bereiter Approach. In J.L. Frost and G.K. Hawkes (Eds.) The Disadvantaged Child: Issues and Innovations, New York: Houghton-Mifflin, 1970.

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Day 1 - Orientation 1:00 - 4:00 classroom

Assignment: read text

A. Close attention to all Chapters except 9 & 10

B. Knowledge of Chapters 9 & 10

Day 2 - Reading day - no class Individual conferences

Day 3 - 1:00 - 3:30 - Question and answer period - classroom

- Evaluation

A. Oral test on text and orientation materials

B. Students will sign up for time slot

Day 4 - Use of DISTAR Materials 1:00 - 3:30 classroom

Assignment: Skim supplementary material

Day 5 - Use of DISTAR with one child at field center

Day 6 - classroom

Videotaped at field center with one child using DISTAR material

Discussion of video tapes

Group practice

Behavior problems (pp. 78-91)

Assignment: read several articles

Days 7, 8, & 9 - Practicum in respective field sites (8:00 - 12:00)

Evaluation: video tape 3rd day of practicum experience

Day 10 - Review evaluation video tapes

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Instructions for Reading the Text

When you are reading the text, you will find yourself inundated with pertinent information. The following are given to aid you in your reading. When you read, do not try to learn every bit of information on the first reading. Try to glean basic information. Know the types of children who benefit from this program, and why. Be able to define the classroom set up most complimentary to this approach. If possible, derive a self-made formula that implants the basic question and answer structure in your mind. The following key phrases and steps may be helpful:

1. Singular identity statement
2. Plural identity statement
3. "Yes-no" questions
4. "What" questions.
5. Negative identity questions
6. "Where" questions

While you attend to structure, keep in mind the time suggested for different units, and how your own mistakes and the child's may be corrected. Remember -- everyone makes mistakes, but the intelligent person corrects these mistakes and learns from them.

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